

come) than rural areas.⁹ With higher rural costs, rural customers pay a higher percentage of income for telephone service than do their wealthier counterparts in urban areas, in spite of the support payments they receive.

Thus we see that the basic equity concern that has underlain much of the support mechanisms for rural telephony in the past -- that rural citizens have access to vital telecommunications services on reasonable terms -- still holds true today.

Network Externalities. In addition to the basic equity justifications for supporting rural telephony, it is important to recognize that there are also strong efficiency reasons for doing so. Some of the efficiency reasons are based on the benefits realized by all telephone users from having access to a ubiquitous telephone network and the unequal distribution of the costs associated with providing that ubiquity.

In taking telephone service, a telephone customer realizes certain benefits from being able to contact other people on the network. These are personal benefits associated with having telephone service. In addition, by making oneself available on the network, each telephone subscriber makes the public network more valuable to others. From the

⁹ Id.

individual subscriber's perspective, the benefit conferred on others is an "externality" -- commonly referred to as a network externality -- and not part of the individual's decision of whether or not to take service.

Because each individual is willing to pay only for the personal benefits of service, some people will not subscribe because the personal benefits are too low even though they would make a positive contribution to the value of the network if the value of their presence on the network to other subscribers was factored in.

In rural areas, the problem of network externalities leading to suboptimal subscription levels is compounded by costs of service substantially above their levels in urban areas. As long as a LEC's facilities are supported solely by payments from the LEC's subscribers, the high cost of rural service means that rural residents are much more likely to be driven off the network by prices that exceed the value of service to them personally than are people living in urban areas. Therefore, a well-designed telecommunications policy will provide support for rural service so that other users will not be denied the benefits of being able to reach rural residents through the public network. The following example illustrates this very simple, but very important point:

EXAMPLE 1

Consider an urban area and a neighboring rural area with a total of 140,000 households between them -- 4,000 residing in the rural area and the other 136,000 in the urban area. The value of telephone service to a household is .02 cents per month for each household connected to the network (including itself). Thus, if all 140,000 households take telephone service, each would be willing to pay up to \$28 per month ($140,000 \times .02$ cents).

Suppose that the average cost per subscriber of providing service was \$40 in the rural community, but only \$16 in the urban community -- the discrepancy being due to economies of scale that favor large LECs and the other factors raising rural costs discussed above. If telephone companies in each community could draw on payments from their subscribers only, the rural area would never have telephone service because the aggregate of rural customers' willingness to pay is \$112,000 ($4,000 \times \28, assuming all 140,000 households subscribe), while the total cost of the rural service is \$160,000.

Providing rural LECs with \$48,000 ($\$160,000 - \$112,000$) worth of support is clearly efficient because connections to the 4,000 rural households would increase the value of the network to each urban subscriber by 80 cents ($4,000 \times .02$ cents) and to all urban subscribers by \$108,800 ($136,000 \times 80$ cents). Thus, by contributing \$48,000 to the cost of rural service, urban subscribers can realize a \$60,800 net increase in the value of the network to themselves.¹⁰

¹⁰ Of course, the \$60,800 surplus could be shared by rural and urban subscribers by providing service to rural subscribers at less than \$28 per month. For example, if rates were averaged by dividing the total cost of serving the two areas equally among the
(continued...)

Seen in this context, urban telephone users' contribution to the support of rural service is not really a subsidy, even though it is commonly described as such. Rather, it is a mutually beneficial arrangement to which both urban and rural users must contribute for each to realize benefits.

Rural Exchange Competition Would Jeopardize Upgrades to the Rural Telecommunications Infrastructure. An earlier paper by one of the authors presented the economic analyses demonstrating that the future development of the nation's telecommunications infrastructure requires careful planning and coordination, and should not be left solely to competitive, decentralized market forces.¹¹ Among the policy recommendations are:

Proliferation of competitive alternatives erodes the ability of [rural telephone companies] to finance socially desirable upgrades to the public switched network. Regulators should maintain the integrity of monopoly franchises for rural local exchange carriers.

¹⁰(...continued)

140,000 households, rural and urban subscribers would both pay \$16.68 a month, a 68 cent increase over the cost of urban service. Since urban subscribers value access to the 4,000 rural households at 80 cents a month, they would still be better off than they would be if they did not contribute to the support of the rural service.

¹¹ J. Panzar, The Economics of Telecommunications Infrastructure Enhancement 16 (April 1990).

Internalizing network externalities requires a continued injection of funds, such as [Rural Electrification Administration] loans and other transfer mechanisms, to help finance infrastructure upgrades in rural areas.

Regulators should encourage local exchange carriers to upgrade their networks in a timely manner by approving the necessary investments and the tariffs required to finance them. This will help prevent inefficient, often irreversible, bypass by users seeking advanced capabilities before they are incorporated into the public switched network.¹²

Rural Exchange Competition Would Increase Support Burdens Elsewhere in the System and Could Jeopardize Universal Service.

A fundamental problem with local exchange competition in rural areas is that rural telephone customers vary dramatically in their contributions to the costs of rural LECs, primarily due to large differences in calling volumes and loop costs. Some customers, such as high-volume business customers, may cover their own incremental costs of service and

¹² Id. (emphasis added). Similarly, the California Public Utilities Commission embraced the objectives of "encouragement of technological advance" and "full utilization of the local exchange network":

Full network utilization has two components: (1) retaining and expanding the customer base for existing services and (2) adding new services. Higher levels of network utilization lower average costs and can mean avoidance of duplicative investment.

Re Alternative Regulatory Frameworks for Local Exchange Carriers, 107 P.U.R.4th 1, 53, 59 (1989) (emphasis added).

make substantial contributions to central office and overhead costs; but other customers, such as isolated farms, do not begin to cover the costs of connecting them to the network.

While the franchised rural LEC is obligated to provide service to all who request it, it is the high-volume customers who make the largest contribution to common-cost recovery that will be seen as targets of opportunity by the LEC's competitors. These high-volume customers will be relieved of contribution, but at the expense of low-volume rural customers, the customers of urban LECs, and IXC customers. The "losers" from rural competition will have to increase their contributions to support rural service to make up for the reduced contributions to common costs caused by competition for high-volume rural business customers.¹³ Thus, competition, among other things, becomes a vehicle for shifting a portion of the cost burden of supporting rural telephony from high-volume rural ratepayers to ratepayers elsewhere in the system.

¹³ See C. Monson & J. Rohlf, "The \$20 Billion Impact of Local Competition in Telecommunications" (July 16, 1993) ("Careful planning is required as public policymakers introduce competition into the local exchange marketplace The industry will have approximately \$20 billion [per year] at stake when that happens. Policymakers need to plan now for a smooth transition to competitive pricing [C]ustomers without viable alternatives will suffer the most.").

Rural LECs are uniquely vulnerable to access and toll bypass because, given their small scales of operation, average cost is highly sensitive to changes in volume, and toll and access traffic account for a much larger fraction of total revenue for rural LECs than for urban LECs. Whereas REA LECs receive 65.7 percent of their operating revenues from toll and access revenues, BOCs receive just 44.2 percent.¹⁴ Furthermore, bypass causes much more severe hardship for rural LECs because one or a few high-volume customers often account for a disproportionately large share of their traffic and revenues.

The example of the Decatur Telephone Company, provided in Appendix C, demonstrates the degree to which rural LECs may be vulnerable to bypass. Decatur has 811 access lines, of which 175 (about 22 percent) are business lines. A single business customer accounts for 37 percent of Decatur's business lines, 8 percent of its total lines, and approximately 20 percent of its revenues from both intrastate access and billing and collection services.

Transferring Support Flows From Rural LECs to Competing Rural Providers Would Exacerbate the Fundamental Problems of Telephone Competition in Rural Areas. If, despite the previous analysis

¹⁴ See Appendix A.

favoring continuation of rural exchange service monopolies, regulators allow competition in rural exchange services to develop, then care must be taken in designing the support mechanisms for rural service. Of course, LECs serving rural areas already contend with cellular competition for both residential and business services, and access competition in the form of VSAT networks, microwave links, and other bypass technologies. But several recent proposals envision competition on a much more massive scale with far greater potential consequences for rural infrastructure investments, operations, and support flows.¹⁵

Transferring rural support flows from the franchised LEC serving rural areas to all competing carriers on a per-customer basis would increase required support flows and encourage inefficient bypass. Allocating support on a per-customer basis makes matters worse because this type of support may be used, under competitive conditions, to attract high-volume customers through below-cost pricing rather than to defray costs of serving all rural customers.

Support for high-cost rural telephone service has traditionally been administered through various types of assistance provided directly to franchised, local monopoly LECs serving rural areas. The

¹⁵ See supra note 3.

traditional rural support system is being questioned amidst the current initiatives encouraging local exchange competition, unbundling, and cost-based rates. For example, the New York Public Service Commission ("N.Y. PSC") has recently asked for comment on a tentative proposal that would replace the traditional rural support system with one in which rural support would be allocated on a per-customer basis to any competing rural carrier serving qualified subscribers.¹⁶ The Association of Local Telecommunications Services ("ALTS") has echoed this suggestion in a subsequently-released position paper.¹⁷

Two different mechanisms have been proposed for channeling per-subscriber support payments to competing rural service providers. One would pay the support allotted to a rural customer directly to the LEC or competing carrier serving him or her. An alternative approach would pay the support directly to the subscriber, who would pass it on to the LEC or competing carrier he or she selects for service. For example, a subscriber might be given a monthly card representing credit for a

¹⁶ Proceeding on Motion of the Commission Regarding Comparably Efficient Interconnection Arrangements for Residential and Business Links, Order Accepting In Part and Modifying In Part Compliance Tariff Filing at 4-5, Case No. 91-C-1174 (N.Y. PSC, issued Dec. 18, 1992).

¹⁷ ALTS, Telecommunications Policy '93 -- A White Paper at 13-14 (1993) ("ALTS White Paper").

certain dollar amount of telecommunications services that would be redeemed when a LEC or competing carrier receiving the card as payment by the subscriber turned it in to the appropriate provider of the support funds.

By itself, competition among local rural carriers would likely increase the rural support payments required to maintain ubiquitous rural service because contributions to the common costs of rural service by high-volume, low-cost customers would decline, as explained above. Tying support to subscribers under either of the two schemes just described would likely exacerbate this problem by encouraging the provision of service at prices below incremental cost to high-volume customers who otherwise would be both willing and able to cover these costs themselves. Therefore, price competition is likely to lead to a direct transfer, through lower prices, of a portion of that support to high-volume customers' pockets, where it cannot be used to defray the costs of rural telephony as intended.

Thus, whereas high-volume rural customers would, in the case of competition without per-customer support payments, see their contributions to the support of generally-available rural service reduced (possibly to zero), these customers could actually become net recipients

of support in the case of per-customer support payments. This is because per-customer support payments would likely cause a part of the support payments to be syphoned off to high-volume customers, which would necessitate an increase in the total support payments required to maintain rural service.

Example 2 illustrates the manner in which competition for per-customer support payments not only promotes pricing below incremental costs and inefficient bypass competition for high-volume customers, but also increases the rural support burden for telecommunications customers elsewhere. Example 2 expands on Example 1 by adding a competitor to the incumbent rural LEC and by providing more detail about the costs of rural service.

EXAMPLE 2

The rural LEC'S total cost of \$160,000 per month incurred in providing service to the 4,000 telephone customers in its home service area is composed of \$15,000 in fixed costs associated with administering, equipping and operating the central office, \$40 per loop for each of 3,000 long loop customers scattered among a variety of locations some distance from the central office, and \$25 per loop for each of 1,000 short loop customers closer to the central office's location, which is the natural site for a switch in this service area. The corresponding per loop costs for the competing carrier are \$41 and \$26, respectively. At any price above \$26, the competing carrier would find it profitable to enter the local market to serve the short loop customers. There-

fore, with competition the price to short loop customers cannot be set above \$26.

This situation regarding costs and possible subscriber fees is described in Table 1:

Table 1
Loop Costs and Subscriber Fees with
Traditional Rural Support and with Simple Competition

	<u>Long Loop Customers</u>	<u>Short Loop Customers</u>
Number of Customers	3,000	1,000
Incumbent LEC (incremental cost/loop)	\$40	\$25
Competing Provider (incremental cost/loop)	\$41	\$26
Maximum Subscriber Fee	\$28	\$28
Pre-Competition Revenue per Customer	\$28	\$28
Minimum Competitive Price ¹⁸	\$28	\$26
Competitive Revenue per Customer	\$28	\$26

Assume that without competition all rural telephone customers pay \$28 for service, which is the maximum they are willing to pay, and the rest is covered by transfers from telephone users elsewhere.¹⁹ In Example 1, we calculated

¹⁸ With competition and no per-subscriber support payments, the cost of serving subscribers in the incumbent LEC's territory constitutes a floor below which competitive prices will not fall.

¹⁹ The assumption that in the absence of competition rural subscribers pay full value for service simplifies the exposition, but is in no way necessary to the conclusions reached below.

that \$48,000 in support over and above subscriber payments would be required to provide telephone service in one of these rural areas, because revenues from customers amounted to \$112,000 while the sum of loop and fixed costs totaled \$160,000.

Now we allow a new carrier to compete for customers in the incumbent LEC's service territory.²⁰ Suppose that the incumbent LEC retains its short loop customers by offering them a price of just under \$26, the incremental cost to the competing carrier of serving these customers. Simple arithmetic shows that the inflow of support payments required by the incumbent LEC to provide telephone service to all of its customers has increased from \$48,000 to \$50,000. The 1,000 low-cost rural customers are better off because the service that once cost them \$28 a month now costs \$26 a month, *but their gains are paid for by a \$2,000 increase in support from telephone users elsewhere in the state.*

Allocating support for rural service on a per- customer basis

does not solve this problem -- in fact, it is likely to make it worse:

Assume that the \$48,000 formerly paid directly to the incumbent LEC is now tied to customers and paid directly to the carrier they choose for service at \$12 per head. The new competitive situation is described in Table 2:²¹

²⁰ Clearly this competition will take place over the short loop customers, since the maximum feasible payments from long loop customers do not cover their loop costs.

²¹ Targeting subsidies to those consumers unable to "afford" telephone service, as recently suggested by ALTS, supra note 17, is in no way a solution to the fundamental problems that must be addressed in providing rural telephony. "Affordability" is a highly ambiguous term and its usefulness in the discussion of rural telephone policy is questionable at best. Without rural support payments, many rural telephone customers would not subscribe to telephone service. But this has nothing to do with whether they could get the money together to pay for it (i.e., afford it). Rather, they would have done without it because its value to them personally was less than the cost. It was the value of their accessibility to telephone subscribers elsewhere that justified the provi-

(continued...)

Table 2

**Loop Costs and Subscriber Fees with
Competition for Rural Support Payments**

	<u>Long Loop Customers</u>	<u>Short Loop Customers</u>
Number of Customers	3,000	1,000
Incumbent LEC (incremental cost/loop)	\$40	\$25
Competing Provider (incremental cost/loop)	\$41	\$26
Maximum Subscriber Fee	\$28	\$28
Minimum Competitive Price	\$28	\$14
Competitive Revenue per Customer	\$40	\$26

Note that the long loop customers are unaffected by competition, even when there are support payments at stake. For short loop customers, however, the effect is dramatic. They now receive service at a price that is substantially below incremental cost because, with the \$12 per-customer subsidy, the entrant's effective cost of providing service to these customers is \$14 -- the cost of a loop minus the support payment.

Even more so than in Table 1, short loop customers' gains from competition are purchased at the expense of urban and IXC customers contributing support for rural telephone service. Competition for per-customer support increases

²¹(...continued)

sion of the external support required to provide service to these rural customers.

dramatically the amount of rural support that is required because *support payments for low-cost customers are competed away. All of the \$12,000 in support tied to short loop customers is passed on to the short loop customers in competitive price cuts, leaving none of it to defray the fixed costs of rural service.*

We saw before that the \$48,000 revenue shortfall that had to be made up through transfers from elsewhere in the industry under franchise monopoly increased to \$50,000 with the introduction of competition. With competition for \$48,000 in per-customer transfers, the shortfall increases to \$62,000.

To this point we have assumed that per-subscriber support payments are paid directly to competitive carriers; but the basic outcome of competition would be the same if the support payments were instead given to rural telephone customers to pass on to their carrier of choice.

The following analysis is a variation on Example 2:

Suppose that the \$12 in support was given to customers rather than to a LEC or competing carrier. Then the incumbent LEC would charge a net price for its service to its short loop customers at just under \$14 to avoid losing them to the competing carrier. As payment, a short loop customer would hand over to the incumbent LEC both a personal check for approximately \$14 and its "telecommunications voucher," for which the provider of the support funds would pay the LEC \$12. The LEC's revenue from this customer would still be \$26, and the net cost to the customer would still be \$14 -- a \$12 reduction from the \$26 it would have paid with simple competition. And, just as with payments directly to competitive carriers, the short loop customers that contributed \$3 apiece to the LEC's common costs of rural service without competition and \$1 apiece with simple competition are now in effect receiving service

at \$11 below the incumbent's incremental cost of \$25. In other words, the entire \$12 in per-customer support ends up in the pockets of the 1,000 short loop customers. As in the case of per-customer support paid directly to competitive carriers, support paid directly to customers would increase the total support required to cover the cost of rural service to \$62,000.²²

The situations described above are clearly unstable because, barring an infusion of the additional \$14,000 in support, the incumbent LEC will lose money continuously.²³ Theoretically, these problems could be solved by customizing subscribers' support payments so that the support received by any individual customer would reflect his or her own willingness to pay for service as well as the cost of providing service to that customer. Unfortunately, it is not likely that such a scheme could ever be effectively implemented because the task of collecting the relevant information would be overwhelming. This example has only two types of cost-differentiated consumers. But a myraid of factors (calling volume, population density, age of equipment, size of exchange,

²² This basic dilemma cannot be solved by increasing the per-subscriber transfer for high-cost subscribers relative to what is paid for low-cost customers. Once the payment for high-cost customers becomes high enough to encourage competition for their patronage, the excess of what is required to cover incremental costs will be passed on to consumers in competitive price cuts.

²³ The incumbent LEC would also lose money continuously without additional support if it lost its short loop customers to competitors but was obligated to continue serving long loop customers.

terrain features, shared infrastructure, etc.) affect the incremental cost of providing service to a subscriber in the real world; and both the absolute and relative importance of these factors vary over time and among localities. As long as support is granted on a per-subscriber basis, the problems illustrated by the example will remain.

While the competitor has higher costs in the example, all of the problems illustrated would still arise if the competitor could serve the short loop customers at a lower incremental cost than the incumbent LEC. Suppose the cost to the competitor of serving short loop customers was \$24 per customer, rather than the \$26 assumed, and short loop customers switched to the competitor who now has the \$1 cost advantage. For the incumbent LEC to continue meeting its universal service obligations to its long loop customers, it would still need an additional \$3,000 in support payments from external sources to make up for the short loop customers' former contributions to common costs. The competitive entrant would still win the short loop customers if \$12 per subscriber support payments were added to the competitive stakes. But as before, the short loop customers would receive service at less than incremental cost, necessitating an increase in rural support payments above the amount required without competition.

Therefore, it is critical that support payments continue to be focused on the LEC and not on individual customers.

If regulators allow competition against rural LECs to grow, this analysis shows that support payments should continue to be provided to LECs with universal service obligations because providing support payments to multiple carriers on a per-customer basis (paid directly either to the serving carrier or to a customer to pass on to a serving carrier) would spur pricing below incremental costs, inefficient bypass, higher support burdens and unstable financial conditions. In addition, the ways in which continuing support for high cost rural customers will be funded must also be carefully considered.

Rural LECs have traditionally relied on two sources of support for the services they provide their high customers: 1) contributions, such as those distributed from the Universal Service Fund and long-term support mechanisms, that come from IXC's and LECs serving low-cost urban areas, and (2) prices in excess of incremental cost paid by low-cost customers in their own service areas. Under the various plans for competition that have been proposed so far, this second source of support is diminished and could dry up entirely. Therefore, one or both

of the following adjustments will have to be made in rural support mechanisms.

One is to increase the contributions to rural support made by telecommunications users in other parts of the country. To minimize the burdens of rural support and the increases that would be required, efficient mechanisms for financing that support, such as bulk billing, should be implemented.

The other alternative is to maintain low-cost rural customers' contributions to the support of high cost customers in the same service areas by institutionalizing such support as customer-specific obligations to be paid by any carrier providing them with telecommunications services. If customer-specific obligations were determined according to the principles of efficient component pricing (explained below), only efficient competitors would enter and low-cost rural customers' contributions to service for high-cost customers would be maintained.²⁴ However, the problems associated with identifying the

²⁴ Bulk billing and efficient component pricing are discussed in more detail in the next section. Whatever mechanisms are used to generate the necessary support for high cost rural customers, it is important that rural LECs be given the pricing flexibility needed to respond to competitive offers, providing of course that these responses do not themselves violate the principles of efficient competition. In other words, the normal proscriptions against predatory pricing would still apply to rural LECs.

costs of high-cost customers, discussed above, are also likely to plague attempts to assess the magnitudes of contributions of individual low-cost customers.

II. Support Flows for Rural Areas Should Continue Through Mechanisms Consistent With Competitive, Unbundled Urban Exchange Services

We have previously explained that urban subscribers benefit by providing support to rural subscribers. However, the growth of competition in the markets of urban LECs may significantly harm rural LECs and their customers, even if the principle of franchise monopoly is maintained in rural areas. This is because significant support flows from urban customers to rural customers currently exist that would be jeopardized by urban local exchange competition. A variety of mechanisms are employed to average toll rates and access rates across rural and urban exchanges.

Some rural support mechanisms consist of minutes of use ("MOU") surcharges on rates for LEC switched services and depend upon the ability of urban LECs to price above incremental cost. The advent of local exchange competition in urban areas is increasingly

reducing the ability of urban LECs to price above incremental cost because IXCs have the ability to purchase bypass services.

The main type of competitive initiative currently under consideration in urban areas focuses on the *unbundling* of local exchange services. This approach is spelled out most clearly in the recent proposals of Ameritech and the Rochester Telephone Company.²⁵ The philosophy behind the unbundling approach is that technological advances, demand growth, and changing economic conditions have reduced or eliminated the natural monopoly characteristics of many of the service components provided by LECs. Nevertheless, it is recognized that other service components (e.g., large databases and sophisticated switches) are characterized by such strongly increasing returns to scale that the successful emergence of head-to-head competition among multiple, fully integrated LECs is currently unlikely in all but the most densely populated

²⁵ See Petition for Declaratory Ruling and Related Waivers to Establish a New Regulatory Model For the Ameritech Region (FCC, filed March 1, 1993); Petition of Rochester Telephone Corporation for Approval of Proposed Restructuring Plan, Case No. 93-C- (N.Y. PSC, filed Feb. 3, 1993). While the Rochester Telephone Company plan calls for the formation of two separate companies (one "wholesale," one "retail"), the Ameritech proposal relies on unbundling and other procedural safeguards, rather than structural separation, to assure nondiscriminatory access to remaining monopoly facilities.

urban areas. Since such facilities will typically continue to be provided on a monopoly basis, current proposals for increased local exchange competition include provisions regulating the terms under which incumbents must share these facilities with their competitors.

Given these initiatives towards competitive unbundling of local exchange services, new rural support mechanisms must be developed prior to expanding such competition. One possibility would be for the urban LEC or some neutral third party to "bulk bill" each access customer (including the LEC or any of its affiliates) for rural support. A nondiscriminatory basis for determining each access customer's billing would be the customer's relative market share based on the toll revenue reports filed with and reported by the FCC, like the method the FCC uses for funding interstate telecommunications relay service and for compensating payphone providers for access-code calling.²⁶ Similarly, IXCs cur-

²⁶ See Telecommunications Relay Services, and the Americans with Disabilities Act of 1990, FCC No. 93-357 (rel. July 20, 1993) (funding obligations applicable to every carrier providing interstate telecommunications services); Policies and Rules Concerning Operator Service Access and Pay Telephone Compensation, 7 FCC Rcd 3251, 3259 (1992); Petition For Declaratory Ruling and Related Waivers to Establish A New Regulatory Model For the Ameritech Region at A-13 (filed with the FCC on March 1, 1993).

rently contribute to the Universal Service Fund on the basis of their shares of presubscribed access lines (a form of bulk billing).²⁷

A major advantage of a bulk billing mechanism is that it would collect rural support without distorting the relative prices of access services offered by the LECs and their competitors. By bulk billing rural support payments, the incentive of IXC's inefficiently to bypass the LEC network is eliminated because IXC's must pay the same amount regardless of the extent to which they utilize LEC facilities. Bulk billing offers efficiency gains generally endorsed by economists. For example, in April 1993, David Teece, a business professor at the University of California at Berkeley, wrote strongly in favor of Ameritech's bulk billing proposal:

Ameritech's bulk billing proposal . . . has a number of important advantages over the FCC's current subsidy structure. Because it is a charge on an output (long distance

²⁷ See National Telephone Cooperative Association, Universal Service Fund Discussion of Issues (July 1993). As shown in Appendix A, approximately 86 percent of USF funds goes to telephone service areas with under 200,000 loops. On average, \$6.74 per loop per month goes to service areas containing less than 200,000 loops, while \$0.28 per loop per month goes to service areas containing over 200,000 loops.

USF funding only covers approximately two percent of unseparated non-traffic sensitive ("NTS") revenue requirement nationwide. In addition, the contribution IXC's make to the USF amounts to only 1.3 percent of IXC toll revenue.

service) purchased by consumers, it cannot impede cost-based competition in the sale of access inputs purchased by IXC's. Proper competition in toll services cannot be achieved with a system that recovers subsidies through charges on LEC switching. Only when the rates for access services mirror their costs can one expect profit incentives to lead carriers to employ the most efficient combinations of access services/sources. Moreover, as costs fall, competition will ensure that these savings are passed on to consumers. Finally, Ameritech's bulk billing proposal has the advantage of preserving relative price relationships on the output (toll) side and this will avoid distorting ultimate consumption decisions.²⁸

The theoretical basis for a variety of "competitively neutral" mechanisms for raising overhead funds in a competitive environment through the pricing of residual monopoly services has recently been provided by Professor William Baumol of New York University.²⁹ Baumol's proposed pricing methodology, Efficient Component Pricing ("ECP"), preserves the overhead contributions received by LECs even if competitors succeed in capturing some of their customers. This approach to the residual regulation of LECs makes it possible for current

²⁸ D. Teece, Restructuring the U.S. Telecommunications Industry For Global Competitiveness: The Ameritech Program In Context at 72 (April 1993).

²⁹ W. Baumol, Deregulation and Residual Regulation of Local Telephone Service, American Enterprise Institute (March 1993). See also Affidavit of A. Kahn filed in the FCC's proceeding Expanded Interconnection with Local Telephone Company Facilities, CC Docket No. 91-141, at 16-17 (Aug. 1991).

support flows and subsidy arrangements to continue in spite of increased competition in local exchange markets. Because it makes it possible for policy makers to enjoy many of the efficiency benefits associated with urban competition without threatening the transfers which support universal service, ECP should play an important role in the regulation of competitive local exchange markets.³⁰

With ECP, only efficient entry is encouraged. Resources are not wasted by inefficient entrants. The way in which ECP promotes efficient entry is illustrated in the following example:

EXAMPLE 3

Suppose the incumbent's marginal costs of providing one service component that it alone supplies and a second service component (for which it faces competition) of its final service are \$.10 and \$.05, respectively, while the initial price for the final service is \$.25. The final service provides the incumbent a contribution of \$.10 per unit (\$.25-\$.05-\$.10). The ECP price for the less-competitive (monopoly) component is \$.20. (The \$.10 contribution plus the \$.10 marginal cost of the first component.)

Social efficiency requires that entry occur only if entrants can match or beat the incumbent's \$.05 cent marginal cost of providing the competitive component; but the ECP price of \$.20 insures exactly this result. The \$.05 difference between the incumbent's \$.25 price for the final service and the ECP price of \$.20 for the less-competitive component ensures that only entrants able to produce the competitive

³⁰ Appendix D provides a thorough introduction to the basic principles involved in ECP.